

WHAT IS CLAIMED IS:

1. A substrate for a semiconductor device comprising:

a crystalline silicon substrate;

5 an insulative silicon compound layer thereon and

a crystalline insulation layer on said insulative silicon compound layer,

10 wherein said insulative silicon compound layer contains not more than 10at% of component element of a material constituting said crystalline insulation layer, the component element being provided in said insulative silicon compound layer by diffusion.

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2. A semiconductor device substrate according to claim 1, wherein the component element is not more than 5at%.

20 3. A semiconductor device substrate according to Claim 1, wherein said crystalline insulation layer comprises at least one of YSZ, Al_2O_3 , CeO_2 , MgO , $SrTiO_3$ and ZrO_2 , and said insulative silicon compound layer comprises at least one of silicon oxide, silicon 25 nitride and silicon oxide nitride.

4. A SOI substrate comprising said substrate for

the semiconductor device as defined in Claim 1,
further comprising a crystalline silicon on said
crystalline insulation layer.

5 5. A manufacturing method for a semiconductor
device substrate, comprising:

 ejecting in non-active gas a metal oxide
constituting a crystalline insulation layer;

10 forming a crystal layer of a crystalline
insulative material on a silicon substrate heated up
to not lower than 400°C;

15 forming an insulative silicon compound layer
on said silicon substrate by oxygen diffusion from an
oxide during said crystal layer formation step, oxygen
diffusion during a temperature holding time after said
crystal layer formation step and/or oxygen diffusion
during cooling operation.

20 6. A method according to Claim 5, wherein said
silicon substrate and said target are disposed opposed
to each other in a sputtering apparatus, and discharge
of the non-active gas supplied into the sputtering
apparatus is produced to grow the crystal layer of
said crystalline insulative material.

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7. A method according to Claim 5, wherein said
target comprises ZrO_2 and Y_2O_3 which are mixed or

which are solved; said non-active gas is argon; said crystalline insulation layer is YSZ; said insulative silicon compound is silicon oxide; and a component constituting the crystalline insulation layer which 5 are contained in insulative silicon compound by diffusion is Zr and/or Y.

8. A method for manufacturing SOI substrate comprising a method as defined in Claim 5, wherein 10 crystalline silicon film is formed on the crystalline insulation layer which is formed on the silicon substrate.

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